BOL'SHAKOV, D.I., inzh.; BELOLIKOV, V.V., inzh.

Advanced experience in the construction of the Leningrad subway. Energ. i trud. no.6:61-69 '60. (MIRA 13:11).

1. Lenmetrostroy.
(Leningrad--Underground construction) (Leningrad--Subways)

BOL'SHAKOV, D.I.

Digging the tunnel for the Leningrad subway under the Neva River. Transp. stroi. 13 no.6:25-28 Je '63. (MIRA 16:9)

1. Nachal'nik stroitel'stva Leningradskogo metropolitena.
(Neva River--Tunneling)

BOL'SHAKOV, F. I.

TA 20T82

USSR/Radio Apr 1946
Television - Receivers
Television - Standards

"What Moscow Will See," F. I. Bol'shakov, Director of Moscow Television Center, 2 pp

"Radio" No 1

Construction of a 2-3 thousand seat television auditorium at the Moscow Television Center. List of some of the productions already televised like Tschaikovski's "Swan Lake." Work being conducted to increase the quality of reception. At present television centers are organized only in Moscow, but plans call for nationwide radio-television centers.

20T82

BOL'SHAKOV, Grigoriy

Movie is on the way
Kinomekhanik, no. 7, 1952

GOL'BEK, G.; BOL'SHAKOV, G.; REYTAROVSKIY, Ye.

The IuT-1 and IuT-2 radiometers. IUn.tekh. no.8:69-76 Ag '57.
(MLRA 10:8)

(Radiometer)

BOL'SHAKOV, G.

A society exists but there is little work. NTO 3 no.3:36-37 Mr '61. (MIRA 14:3)

1. Zaveduyushchiy otdelom truda i zarplaty oblastnogo soveta profsoyuzov.

(Technical societies)

20055

S/065/61/000/005/001/002
E030/E435

11.1210

AUTHORS: Davydov, P.I. and Bol'shakov, G.F.

TITLE: Influence of Mercaptans on the Formation of Insoluble Deposits in Fuels at High Temperatures

PERIODICAL: Khimiya i tekhnologiya topliv i masel, 1961, No.5, pp.48-53

TEXT: An experimental study has been made of the influence of mercaptans on the formation of insoluble deposits in aviation fuel TC-1 (TS-1), which may contain up to 0.01% mercaptans, according to the sulphur specification in ГОСТ 7149-54 (GOST 7149-54). The influence of bronze and brass on catalysing the deposition has also been studied. By using different crudes, fuel sulphur contents between 0.14 and 0.18% were obtained with corresponding mercaptan contents between 0.005% and 0.211%; a hydrofined Tuymazy kerosene was also studied, with 0.011% sulphur and no measurable mercaptan content. To the latter were then added synthetic octylmercaptans and thiophenols. The fuels were maintained in glass vessels for periods of six hours for temperatures from 100 to 350°C and strips of bronze ВБ-24 (VB-24)

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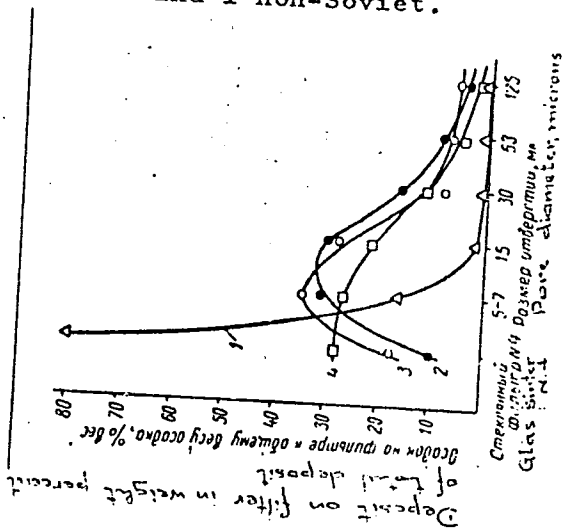
of area 20 cm^2/100 ml fuel, and/or of brass of area 113 cm^2/100 ml fuel, could also be immersed in the fuel to see the effect of the metals. At all temperatures the amount of deposit increased with increasing sulphur content and hydrofined fuel was thermally stable, giving a maximum deposition of only 2 mg/100 ml fuel at 150°C. All fuel deposits showed a maximum around 150°C. When either brass or bronze, or both, were added the deposition in the fuel increased about ten times as strongly, but with thiophenols oxidation decreased; this was associated with a complete removal of thiophenol from the fuel, presumably having formed a protective layer on the metals. A study was also made of the particle size distribution of the sediment by passing the fuel through a cassette, containing a series of filters of pore size decreasing from 125 micron to 5 - 7 micron, followed by a No.4 sinter. Results are shown in Fig.4: influence of mercaptans on the size distribution of insoluble fuel sediments. 1. Hydrogenated fuel TS-1. 2. TS-1 with 0.0105% mercaptans. 3. Hydrogenated TS-1 + 0.01% secondary octylmercaptan. 4. Hydrogenated TS-1 + 0.01% thiophenol. Deposit on filter in

Influence of Mercaptans ...

S/065/61/000/005/001/002
E030/E435

weight percent of total deposit vs pore diameter in microns (glass sinter No.4). There are 4 figures, 5 tables and 5 references: 4 Soviet and 1 non-Soviet.

Fig. 4



Card 3/3

2939

Z/011/61/018/010/007/011
E030/E312

11.0132

AUTHORS: Davydov, P.I. and Bol'shakov, G.F.

TITLE: Influence of natural resinous substances on the thermal stability of jet fuels

PERIODICAL: Chemie a chemická technologie, Přehled technické a hospodářské literatury. v. 18. no. 10. 1961. 468 abstract Ch61-6470 (Khimiya i tekhnologiya topliv i masel, no. 10, 1960, 35 - 38)

TEXT: The thermal stability of jet fuel type TS-1 (TS-1) (boiling range 138 to 230 °C) produced at the Mukhanovskiy refinery from Devonian crude was tested by keeping it at 150 °C for six hours in an air thermostat bath. Four indices of stability were employed: corrosion of a plate of bronze, type BB-24 (VB-24), in g/m^2; deposit on the plate, in g/m^2; quantity of sediment in the fuel, in mg/100 ml.; and the acid value of the fuel. The fuels contained naturally 0.03 to 0.20% wt. of resin, of average molecular weight 185.4, with 7.5 wt.% of total sulphur and 0.35 wt.% of total nitrogen. Before a stability run, the resins in the fuels were removed over silica gel, in a solution of

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Influence of ....

Z/011/61/018/010/007/011
E030/E312

1:1:1 volume mixture of acetone, ethyl alcohol and benzene. Known amounts of resin, from 0.01 - 0.19 wt.%, were then reintroduced. It was found that there was an optimum resin concentration, around 0.07 wt.% and at higher or lower concentrations than this the thermal stability became worse. The thermal stability could be considerably improved by addition of 0.05 wt.% of a sulphur compound (2-phenyl-2-mercaptobutylamine) or of a nitrogen compound (1, 2, 3, 4-tetrahydroquinoline). 5 figures, 5 tables.

[Abstracter's note: the brief Czech abstract has been substituted by an abstract of the original article.]

Card 2/2

DAVYDOV, P.I.; BOL'SHAKOV, G.F.; GLEBOVSKAYA, Ye.A.

Investigating the effect of nitrogen bases on the stability of fuels at increased temperatures. Khim. i tekh. topl. i masel 7 no.10:20-26 O'62 (MIRA 17:7)

ACCESSION NR: AP4009787 S/0065/64/000/001/0055/0058

AUTHOR: Bol'shakov, G. F.

TITLE: The effects of resinous materials formed on storing TS-1 fuel, on its thermo-oxidative stability

SOURCE: Khimiya i tekhnologiya topliv i masel, no. 1, 1964, 55-58

TOPIC TAGS: TS-1 fuel, stability, deresination, oxidation, corrosion resistance, thermal oxidation

ABSTRACT: The composition of the resinous materials formed during storage in TS-1 fuel and the effect of these materials on the thermo-oxidative stability of the fuel was investigated. On storing TS-1 fuel from which resins have been removed by silica gel, the formation of resins is 4.5 times greater, the acid number is 10 times greater and the sulfur and nitrogen content is smaller than on storing fuel from which original resins have not been removed. Apparently oxidation inhibiting materials are removed with the removal of the original resins.

Card 1/2

ACCESSION NR: AP4009787

During storage the nature of the resinous materials changes continuously: they are saturated with oxygen, condensed, and subsequently form insoluble precipitates. The resinous materials formed in storage become progressively more acid with time. On heating fuels from which the original resins were removed, but to which acid resins have been added, the corrosion of bronze and the formation of insoluble precipitates is greater than on heating deresinated fuels to which the initial resin, removed prior to storage, was added.

ASSOCIATION: None

SUBMITTED: 00	DATE ACQ: 10Feb64	ENCL: 00
SUB CODE: FP	NO REF SOV: 006	OTHER: 000

Card 2/2

PHASE I BOOK EXPLOITATION SOV/6346

Bol'shakov, Gennadiy Fedorovich, and Yekaterina Aleksandrovna Glebovskaya

Geteroorganicheskiye soyedineniya reaktivnykh topliv (Hetero-organic Compounds in Jet Fuels) Leningrad, Gostoptekhizdat, 1962. 219 p. Errata slip inserted. 1800 copies printed.

Scientific Ed.: V. A. Uspenskiy; Executive Ed.: Z. G. Segal'; Tech. Ed.: I. M. Safronova.

PURPOSE: This book is intended for scientists and engineers concerned with the chemistry, technology, and utilization of jet fuels and petroleum products. It can also serve as a textbook for students at petroleum institutes.

COVERAGE: The book gives a systematic review of the composition and properties of hetero-organic compounds present in jet fuels TC-1, T-1, T-2, and T-5 and their effect on the thermal and oxidation stability and corrosiveness of these fuels. The ДА-type fuel

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is also considered. The use of infrared spectroscopy for the study of the chemical structure of such hetero-organic compounds is discussed. These compounds are regarded as an important potential source of raw materials for the chemical industry. The authors thank Prof. Ya. B. Chertkov, Prof. A. F. Dobryanskiy, Docent P. I. Davydov, and Docent F. Yu. Rachinskiy. There are 216 references, 112 of which are Soviet.

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Introduction 3

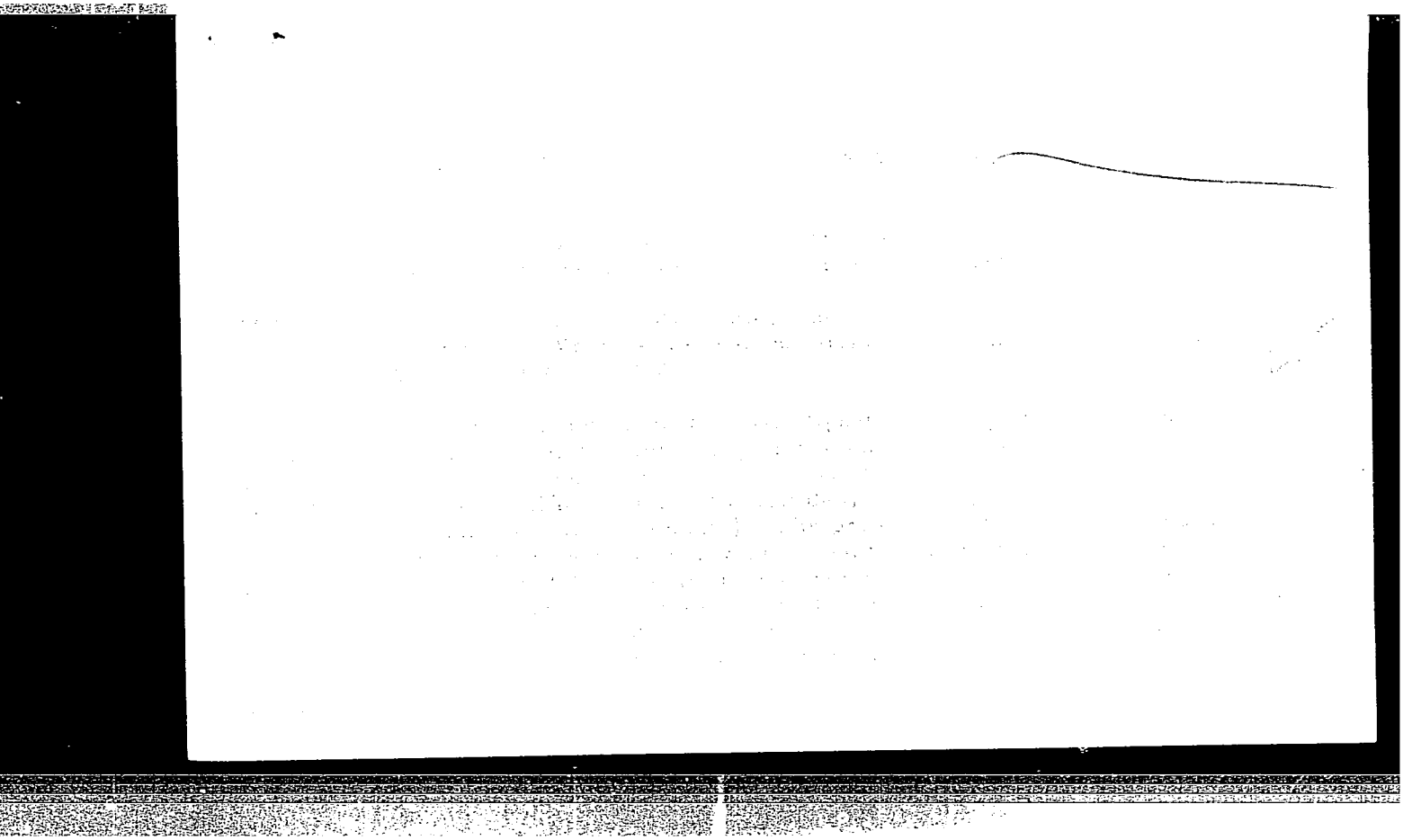
Ch. I. General Characteristics of Jet Fuels 6

Ch. II. Sulfur Compounds 19

Ch. III. Nitrogen Compounds 40

Ch. IV. Naphthenic Acids 48

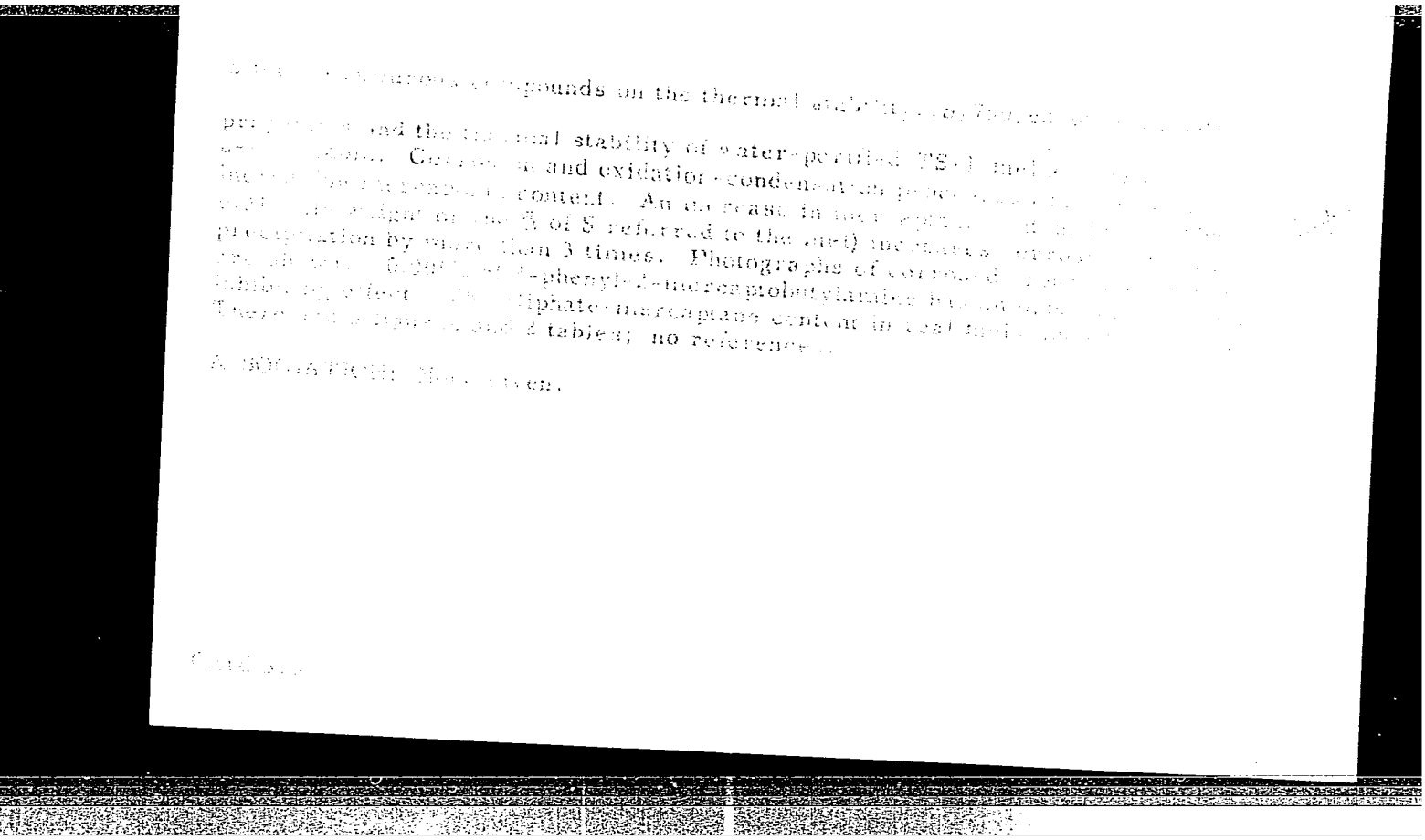
Ch. V. Tarry Substances 58



[redacted] compounds on the thermal stability [redacted]

At [redacted] kg, the calculated fuel temperature in the [redacted] outlet of the fuel-oil heat exchanger 130-150°, and in the fuel pump [redacted] dation leads to the formation of tarry compounds and insoluble products [redacted] clog up the filters and exert a corrosive effect on Cu and [redacted] activity increases at 150-160°, with a maximum at 170-180° [redacted] are especially active. Tests were made with water purified [redacted] obtained from crude of the Devonian horizon of the Mukhanovo [redacted] content is 0.01%; no mercaptans. This base F was doped with [redacted] compounds, and reactions (to simulate existing standard F-1). [redacted] investigated are listed in a full-page table. 150 ml of the [redacted] poured into a 200-ml steel vessel. A precision-weighed (G_1) [redacted] bronze platelet specimen with a total area of 50 cm² was immersed [redacted] The vessel was sealed hermetically and held for 6 hours at 150° [redacted] mechanical stirring. After cooling, filtering through a No. 4 glass [redacted] washing of the precipitate with petroleum ether, the filtrate fuel [redacted] acidity and optical density. The bronze specimen was washed [redacted] and was weighed a second time (G_2), then washed with an alcohol-[redacted] toluene, and reweighed a third time (G_3). The difference G_2-G_3 [redacted] corrosion (in g/m²), whereas G_2-G_1 expressed the deposit [redacted] solubles in the fuel. Test data on the effect of sulfurous compounds [redacted]

Card 2/3



L 11080-63 EPF(c)/EWT(m)/BDS AFFTC/ASD/APGC Pr-4 BW/MN

ACCESSION NR: AP3000504 S/0065/63/000/005/0055/0057

AUTHOR: Bol'shakov, G. F.

TITLE: Insoluble deposits formed during the heating of jet fuels 60

SOURCE: Khimiya i tekhnologiya topliv i masel, no. 5, 1963, 55-57

TOPIC TAGS: jet fuel, fuel stability, metal effect, fuel-metal contact surface, dust, deposit formation, TS-1, deposit

ABSTRACT: The composition of insoluble sediment formed during the heating of insufficiently stable jet fuels in contact with metals has been studied by a method described previously by the author (Davydov, P.I.; Bol'shakov, G. F. Khim. i tekhnol. topliv i masel, no. 10, 1960). The experiments were conducted with S-containing TS-1 fuels which were kept in contact with VB-24 bronze, L-62 brass, D1T duralumin, or 12KhNZA steel for 6 hrs at 150C. It was shown that copper alloys accelerate the autooxidation of the fuels, are conducive to deposit formation on the metal, and increase fuel corrosiveness. Increase of the fuel-metal contact area lowers the stability of fuels. The effect of duralumin and steel is much weaker; increase of the contact area with D1T lowers the amount of sediment formed. Metals not only catalytically accelerate sediment formation but also participate in the process--a fact proved by

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L 11080-63
ACCESSION NR: AP3000504

analysis of fuel ash. In addition to S-containing and other heteroorganic compounds, such ash-forming elements as Si, Mg, Ca, Mn, and Ti, which occur in the sediments, play an important role in sediment formation: the most finely divided corrosion products of metals and atmospheric dust particles found in the fuel become aggregation centers for oxidized macromolecular heteroorganic compounds. Removal of ash-forming and other elements from fuels could be a means of slowing down the sediment-formation process. Orig. art. has: 2 tables.

ASSOCIATION: none

SUBMITTED: 00	DATE ACQ: 12Jun63	ENCL: 00
SUB CODE: CH, FL	NO REF SOV: 005	OTHER: 000

Card 2/2 rh/gcK

L 10117-63 EPF(c)/EWT(m)/BDS--AFFTC/APGC--Pr-4--RM/WW/EW/MN/MAY

ACCESSION NR: AP3001314 S/0933/63/005/000/0160/0176

AUTHOR: Bol'shakov, G. F.; Davy*dov, P. I.; Potapenko, T. G.; Rachinskiy, F. Yu.; Slavachevskaya, N. M.

TITLE: Effect of natural and synthetic sulfur- and nitrogen-containing compounds on the thermal oxidative stability of straight-run fuels [Report presented at the Sixth Scientific Session on the Chemistry of Organosulfur Compounds of Crude Oil and Petroleum Products held at Ufa, 27 June - 1 July 1961]

SOURCE: AN SSSR. Bashkirskiy filial. Khimiya seraorganicheskikh soyedineniy, soderzhashchikhsya v neftyakh i nefteproduktakh, v. 5, 1963, 160-176

TOPIC TAGS: TS-1, T-1, DA, thermal oxidative stability, S and N compounds, resin, Getseu corrosion, sediment, amino sulfides, amino disulfides, amino thiols, amino nitriles, thiazolidines, thiazolines, azomethines, ionol, tetrahydroxy-quinoline, 2-phenyl-2-mercaptobutylamine

ABSTRACT: Mixtures of natural S- and N-containing compounds of a "basic" character, i.e., extractable with 25% H sub 2 SO sub 4, were separated from the

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L 10117-63

ACCESSION NR: AP3001314

resinous portions of TS-1, T-1, and DA fuels by a method described by V. V. Getseu (Neftyanoye khozyaystvo, no. 11, 68, 1954). The effect of various amounts of these compounds on the thermal-oxidative stability (TOS) of resin-free fuels at 150C was studied by means of a device designed by the authors. The TOS was evaluated from the corrosion of and amount of sediment on a bronze strip and from the amount of fuel-insoluble sediment. It was shown that mixtures of S- and N-containing compounds improve the TOS of the fuels when used in certain optimum amounts (0.03-0.05% for TS-1, 0.05-0.99% for DA, and 0.02-0.06% for T-1). This improvement was attributed to the ability of certain of these components to inhibit fuel oxidation and to form films on bronze which "protect" the fuel from the catalytic effect of the metal. The effect of individual S- and N-containing compounds on the TOS of fuels was studied by adding to TS-1 fuel 0.05% of one of the synthetic compounds (such as amino sulfides, amino disulfides, amino thiols, amino nitriles, thiazolidines, thiazolines, azomethines, ionol and its derivatives, and tetrahydroxyquinoline and its derivatives). It was shown that most of these compounds lower the TOS of straight-run fuels (with the exception of 2-phenyl-2-mercaptobutylamine, 1,2,3,4-tetrahydroquinoline, certain ionol derivatives, and a reaction product of phenol and styrene). The results of the study indicate that resins of TS-1, T-1, and DA fuels contain compounds (mainly heterocyclic with thiol, amino,

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L 10117-63

ACCESSION NR: AP3001314

and phenyl groups) which, in small amounts, can improve the TOS of fuels. Orig. art. has: 3 figures and 2 tables.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 28May63 ENCL: 00

SUB CODE: 00 NO REF SOV: 004 OTHER: 002

Cdrd 3/3

S/032/63/029/002/010/028
B101/B186

AUTHORS: Glebovskaya, Ye. A., and Bol'shakov, G. F.

TITLE: Application of infrared spectrophotometry to investigations of petroleum products

PERIODICAL: Zavodskaya laboratoriya, v. 29, no. 2, 1963, 172-175

TEXT: This paper was presented at the Soveshchaniye po spektroskopii (Conference on Spectroscopy) held in Gor'kiy on July 5-12, 1961. It reports attempts to identify sulfurous compounds in petroleum products on the basis of their IR spectra. The sulfurous concentrates of the fuels ДА(DA), ТС-1 (TS-1), and Т-1 (T-1) were investigated. Only the general characteristics of the molecular structures could be determined in the range of 3-15μ. In the resin fractions only the presence of oxygen-containing and aromatic structures could be found although the sulfurous concentrates of these fractions contained up to 13% S. The spectra of sec-octyl mercaptane, α-hexyl thiophane, α-(2-methyl butyl)-thiophane, α-(2-methyl amyl)-thiophane, α-octyl thiophane, α-(3-phenyl propyl)-thiophane, thiophene, α-octyl thiophene, diiso-sec-heptyl sulfide,
Card 1/2

isohexyl phenyl sulfide, and di-sec-octyl disulfide were studied in the range of 16-20μ. The sulfides and disulfides showed no characteristic bands in this range, but the heterocyclic compounds were characterized as follows: thiophenes by bands in the range of 18-18.4μ, thiophanes by bands at 17.7μ. Among the fuels investigated, DA indicated the presence of mercaptanes by an 18.5μ band which was missing for TS-1. The 17.5 μ band suggested a content of thiophanes. Neither the mercaptanes nor the thiophanes could be determined potentiometrically in these concentrates. Therefore, the group of "non-determinable sulfur" consists of heterocyclic thio structures. There are 3 figures.

CHERTKOV, Yakov Borisovich; BOL'SHAKOV, Gennadiy Fedorovich; GULIN, Yevgeniy Il'ich; DAVYDOV, P.I., nauchn. red.; SHEVTSOVA, E.M., ved. red.; YASHCHURZHINSKAYA, A.B., tekhn. red.

[Jet fuels] Topliva dlia reaktivnykh dvigatelei. Leningrad, Izd-vo "Nedra," 1964. 225 p. (MIRA 17:3)

BOL'SHAKOV, G.F.

Insoluble deposits formed during the heating of jet propulsion fuels. Khim. i tekh. topl. i masel 8 no.5:55-57 My '63.
(MIRA 16:8)

BOL'SHAKOV, G.F.

Studying the effect of tarry substances formed during TS-1 fuel storage on its thermooxidative stability. Khim. i tekh. topl. i masel 9 no.1:55-58 Ja '64. (MIRA 17:3)

ACCESSION NR: AT4040450 S/2933/64/006/000/0053/0065

AUTHOR: Bol'shakov, G. F.; Glevovskaya, Ye. A.

TITLE: Analysis of the composition of sulfur-organic compounds in the kerosene - gas oil fractions of petroleum

SOURCE: AN SSSR. Bashkirskiy filial. Khimiya seraorganicheskikh soyedineniy, soderzhashchikhsya v neftyakh i nefteproduktakh, v. 6, 1964, 53-65

TOPIC TAGS: fuel TS-1, fuel T-1, fuel DA, sulfur organic compound, aromatic fraction, tarry fraction, benzene desorbed tar, ethanol acetone desorbed tar, sulfide thiophane, thiophene, mercaptan, aliphatic sulfide, disulfide, infared spectroscopy, residual sulfur, kerosene, gas oil, petroleum fraction

ABSTRACT: The report covers a detailed analysis of the composition and structure of sulfur organic compounds present in fuels TS-1, T-L and DA, the properties of which are given. The results are given in tables listing the physical and chemical properties of sulfur organic compounds isolated from aromatic petroleum fractions, the properties of tarry fractions desorbed with benzene or an ethanol-acetone mixture and the properties

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ACCESSION NR: AT4040450

of sulfur organic compounds isolated from benzene or alcohol-acetone fractions of the tars. In addition, 12 sulfur organic compounds, synthesized at the Institut organicheskoy khimii Bashkirskogo filiala AN SSSR (Institute of Organic Chemistry, Bashkir Branch, AN SSSR), were analysed spectrographically for the absorption range 15 - 20 μ (KBr prism, IKS-1 spectrograph). It was found that the tarry components of the fuels contain mostly sulfides, thiophane derivatives and complex hetero-organic compounds. Mercaptans and disulfides were present in minor amounts. "Residual" sulfur consisted mainly of thiophane and thiophene derivatives with admixtures of some S- and N- containing compounds. The aromatic fractions of TC-1 yielded compounds consisting mainly of aliphatic sulfides, alkyl-substituted thiophane and thiophene. Those of fuel DA consisted mainly of sulfides, thiophanes and thiophenes of various structures, and minor amounts of disulfides. It is concluded that infrared spectroscopy in the long-wave range can be employed sucessfully to analyze a group of sulfur organic compounds defying chemical analysis; that group is now termed "residual sulfur" and is considered by the author to consist primarily of thiophenes. Orig. art. has: 4 graphs and 6 tables.

ASSOCIATION: Bashkirskiy filial AN SSSR (Bashkir Branch, AN SSSR)

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ACCESSION NR: AT4040450

SUBMITTED: 00 ENCL: 00

SUB CODE: FP NO REF SOV: 003 OTHER: 004

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L 12456-65 EWT(m)/EPF(c)/EWP(j)/T Pc-4/Pr-4 AEDC(b)/ASD(d)/SSD/RAEM(1) DJ/
ACCESSION NR: AP4048357 WE/RM S/0152/64/000/009/0061/0063

AUTHOR: Bol'shakov, G. F.

TITLE: Apparatus for the study of hydrocarbon oxidizability at elevated temperatures

SOURCE: IVUZ. Neft' i gaz, no. 9, 1964, 61-63

TOPIC TAGS: hydrocarbon oxidation, hydrocarbon fuel, jet fuel, lubricant, rocket fuel, oil temperature stability, oxygen absorption

ABSTRACT: The fact that jet fuels and lubricants used in supersonic aircraft and rockets undergo heating has prompted the development of an improved apparatus for measuring the oxidizability of hydrocarbon fuels and oils. The method is based on the measurement of oxygen absorption as a function of the oxidation time at a given temperature (up to 300C, with an accuracy of ± 0.2C). The apparatus developed by the author differs from standard equipment in that it has a pressure regulator for maintaining constant pressure in the system, thereby eliminating errors due to variations in atmospheric pressure. Diagrams of the apparatus are given, and the pressure regulator is de-

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L 12456-65
ACCESSION NR: AP4048357

3

scribed. Data obtained by the author are compared with those obtained by Chertkov and Marinchenko (1956). Orig. art. has: 2 figures and 1 table.

ASSOCIATION: Voyennaya akademiya ty*la i transporta (Military Logistics Academy)

SUBMITTED: 09May64 ENCL: 00 SUB CODE: FP

NO REF SOV: 010 OTHER: 000 ATD PRESS: 3125

Card 2/2

L 27381-65 EPA/EWT(m)/EPF(c)/EWG(s)-2/EWP(f)/T Pr-4/Pw-4/Paa-4 IT/BW/WE

ACCESSION NR AM4042766 BOOK EXPLOITATION S/

Chertkov, TAkov Borisovich; Bol'shakov, Gennadiy Fedorovich; Gulin, YEvgeniy Il'ich

Jet engine fuels (Topliva dlya reaktivnykh dvigateley), Leningrad, Izd-vo "Nedra", 1964, 225 p. illus., biblio. Errata slip inserted. 2,700 copies printed.

TOPIC TAGS: jet engine fuel, fuel combustion, fuel storage

PURPOSE AND COVERAGE: The book presents information on the chemical composition and service properties of jet fuels. Data are included on the composition and properties of jet fuels, the changes occurring in long-time storage of fuels, and transportation and use in flying vehicles. Experience in improving the service properties of jet fuels through the use of additives is described. The book is intended for engineers and researchers in the field of the chemistry and the use of jet fuels and can be used by students of special higher and secondary educational institutions.

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L 27381-65

ACCESSION NR AM4042766

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Ch. III. Chemical composition of jet fuels -- 64
Ch. IIII. Change in the quality of jet fuels in storage -- 85
Ch. V. Pumpability of jet fuels -- 98
Ch. VI. Thermo-oxidation stability and anti-wear properties in jet fuels -- 138
Ch. VII. Vaporization and combustion of jet fuels -- 191
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SUBMITTED: 23Jan64

SUB CODE: PR, FP

NO REF SOV: 175

OTHER: 093

Card 2/2

KEKKONEN, Fedor Fedorovich; BOL'SHAKOV, G.F., nauchn. red.; NEVEL'SHTEYN, V.I., ved. red.

[Chemical control in gas pipelines and compressor stations] Khimicheskii kontrol' na magistral'nykh gazoprovodakh i kompressornykh stantsiiakh. Leningrad, Nedra, 1964. 158 p. (MIRA 17:12)

BOL'SHAKOV, G.F.

Device for investigating the oxidizability of petroleum hydrocarbons at increased temperatures. Izv. vys. ucheb. zav.; neft' i gaz 7 no.9:61-63 '64. (MIRA 17:12)

1. Voyennaya akademiya tyla i transporta.

L 43927-65 EWT(m)/EPF(c)/T Pr-4 WE

ACCESSION NR: AT5008624 S/2933/64/007/000/0047/0057

AUTHORS: Rachinskiy, F. Yu.; Bol'shakov, G. F.; Brak, Yu. A.; Kremen', M. Z.; Pavlova, L. V.; Potapenko, T. G.; Slavachevskaya, N. M.

TITLE: Synthesis and antioxidant properties of sulfur- and nitrogen-bearing Ionol derivatives

SOURCE: AN SSSR. Bashkirskiy filial. Khimiya seraorganicheskikh soyedineniy, soderzhashchikhsya v neftyakh i nefteproduktakh, v. 7, 1964, 47-57

TOPIC TAGS: antioxidant, sulfur, nitrogen, thermooxidation/ Ionol

ABSTRACT: The retardation of oxidative degradation of hydrocarbon fuels, polyolefins, fats, and many synthetic and derived products was studied. In the present work the authors have synthesized and studied the antioxidant properties of a number of Ionol structural analogs, including azomethynes, hydrazones, amines, sulfides, and disulfides. The properties and compositions of these products are tabulated in the article. The treatment of Ionol with bromine and the condensation of 3,5-di-tert-butyl-4-oxybenzyl bromide with primary, secondary, and tertiary amines takes place with the formation of intermediate compounds of 2,6-

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L 43927-65

ACCESSION NR: AT5008624

di-tert-butyl-4-methylene quinone. Synthetic nitrogen- and sulfur-bearing structural analogs of Ionol are able to retard oxidation reactions not only during degeneration but during development. This results from a capacity to react with the primary radicals of the oxidized substance and also from a capacity to decompose the peroxide and to bind metallic ions of variable valence. Many of the synthesized substances cause effective retardation of thermooxidation of polyolefins and fats, inhibit radiation-chemical oxidation of fats, and some become effective additives for increasing the thermooxidizing stability of jet fuels. Orig. art. has: 1 figure and 4 tables.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: OC, FP

NO REF SOV: 008 OTHER: 010

Card 2/2

BOL'SHAKOV, G.F.; GLEBOVSKAYA, Ye.A.

Thermal oxidizing transformations of sulfur compounds in the medium of normal hexadecane. Trudy VNIGRI no.227 Geokhim.sbor. no.9:37-56 '64. (MIRA 18:1)

ACC NR: AP6006375 (A) SOURCE CODE: UR/0413/66/000/002/0108/0109

INVENTOR: Gulin, Ye. I.; Bol'shakov, G. F.

ORG: none

TITLE: Device for determining the saturated vapor pressure of liquid fuels. Class 42, No. 178150 [announced by Military Academy of Logistics and Transportation (Voyennaya akademiya tyla i transport)

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 2, 1966, 108-109

TOPIC TAGS: liquid fuel, pressure measuring instrument, vapor pressure

ABSTRACT: The proposed device contains a fuel tank located in a thermostat, a measuring system, and a pressure gage (see Fig. 1). To find the real saturated vapor pressure, the fuel tank is made in the form of a v-shaped tube; one side of the tube

Card 1/2 UDC: 531.787.9:543.813

ACC NR: AP6006375

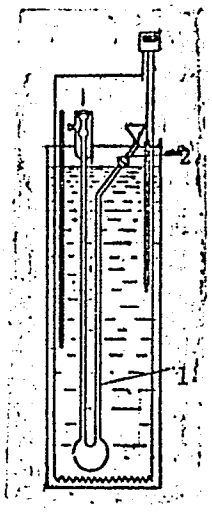

Fig. 1. Device for determining vapor pressure

1 - V-shaped tube with investigated fuel;
2 - vacuum valve.

is equipped with a vacuum valve and the other side is connected to the measuring system and the pressure gage. Orig. art. has: 1 figure. [TN]

SUB CODE: 21/ SUBM DATE: 02Nov64/ ATD PRESS: 4191.

Card 2/2

ACC NR: AP6006450 SOURCE CODE: UR/0065/66/000/002/0047/0049

AUTHOR: Chertkov, Ya. B.; Bol'shakov, G. F.; Glebovskaya, Ye. A.; Englina, G. B. 55 54 B

ORG: none

TITLE: Structure of insoluble fraction of resins of medium boiling range petroleum [jet] fuels 44,55,44

SOURCE: Khimiya i tekhnologiya topliv i masel, no. 2, 1966, 47-49

TOPIC TAGS: jet fuel, fuel gumming property, fuel additive

ABSTRACT: A study has been made of gum formation in straight-run T type [T-1, TS-1, and T-2] [jet] fuels (GOST 10227-62). Resins soluble in the fuels were isolated by silica gel chromatography and divided into three fractions: heptane-, benzene-, and methanol-soluble fractions; in the absence of the heptane-soluble fraction, the other two were insoluble in the fuel. The resins were put back in various amounts into deresinified-fuel samples. Then the sample was stored for one year at room temperature with or without access of atmospheric oxygen, after which existent gums were determined gravimetrically and subjected to IR analysis. It was found that with increasing number of hetero atoms and functional groups in the resin molecule, resin solubility in the fuel decreased. With increasing amount of resins added to the fuel, gums increased. Obviously, the high-molecular-weight portion of the resins, particularly the fuel-insoluble resins, very strongly activated the formation of

Card 1/2 UDC: 001.5:665.521.3

ACC NR: AP6006450

insoluble gums similar to them. The gums were formed by the reaction of compounds of various molecular weights via free oxygen- and sulfur-containing functional groups, and via certain unsaturated bonds in hydrocarbon radicals of hetero atom-containing compounds. When the fuel was in contact with oxygen, gums increased sharply, which confirms the oxidation-polymerization character of gum formation. Gum formation could be limited or prevented by additives. For example, in the presence of 0.005% of a mercaptobenzothiazole derivative [unspecified] in heptane-soluble resin-containing fuel stored for one year in the presence of atmospheric oxygen, the amount of gums formed was 1/5 of that formed in the absence of the additive. Orig. art. has: 1 figure. [SM]

SUB CODE: 21/ SUBM DATE: none/ ORIG REF: 001/ ATD PRESS: 4212

Card 2/2

L 18000-66 EWT(m)/T WE

~~ACC NR:~~ AP6007932 SOURCE CODE: UR/0065/66/000/003/0052/0054

AUTHOR: Bol'shakov, G. F.; Bruk, Yu. A.; Rachinskiy, F. Yu.

ORG: none

TITLE: Additive designed to improve the thermal-oxidative stability of hydrocarbon [jet] fuels

SOURCE: Khimiya i tekhnologiya topliv i masel, no. 3, 1966, 52-54

TOPIC TAGS: fuel additive, antioxidant additive, anticorrosion additive, fuel deposit formation, jet fuel

ABSTRACT: A study has been made of the antioxidant effectiveness in [jet] fuels of an Ionol derivative, 3, 5-di-tert-butyl-4-hydroxybenzylmercaptan (designated BOBM in the source). 0.01—0.05% BOBM was added to the standard hydrocarbon [jet] fuels T-1, TS-1, T-2, and T-5. The thermal-oxidative stability of the fuels with or without BOBM was tested on a LSA RT apparatus (not described) at 100—180C for 4 hr in airtight vessels in the presence of VB-24 bronze. The criteria used for thermal-oxidative stability were: insoluble sediments formed (mg/100 ml), fuel optical density, fuel corrosivity (g/m^2), oxygen absorption (ml), peroxide number (mg O_2/ml), and acidity (mg KOH/100 ml). It was found that BOBM was superior to Ionol with respect to insoluble sediments and corrosivity. BOBM also prevented peroxide and carboxylic acid formation and slowed down yellowing and oxygen absorption. It is

Card 1/2 UDC: 665.521.3

L 18000-66
ACC NR: AP6007932

noted that, unlike Ionol, BOBM reacted with hydroperoxides thereby terminating the chain of the oxidation, and that BOBM actively inhibited oxidation not only at the initial stage but also in the course of this autocatalytic process. Orig. art. has: 5 figures. [SM]

SUB CODE: 21/ SUBM DATE: none/ ORIG REF: 005/ ATD PRESS: 4213

Card 2/2 mg

ACC NR: AP7004124 SOURCE CODE: UR/0152/66/000/011/0057/0060

AUTHOR: Bol'shakov, G.F.

ORG: Military Academy for Support and Transportation (Voyennaya akademiya tyla i transporta)

TITLE: Study of the thermal-oxidative stability of T-1 fuel

SOURCE: IVUZ. Neft' i gaz, no. 11, 1966, 57-60

TOPIC TAGS: jet fuel, fuel composition, fuel deposit formation, fuel hydrocarbon component, alkane, cyclane, aromatic hydrocarbon, monocyclic aromatic hydrocarbon, bicyclic aromatic hydrocarbon, thermal stability, ~~fuel~~ thermal oxidation, fuel stability, sulfur compound, resin, fuel gum

ABSTRACT: The purpose of the study was to determine the effect of the chemical composition and structure of separate compositional fractions of T-1 fuel on their thermal-oxidative stability and on the thermal-oxidative stability of the fuel.

A typical T-1 fuel sample with a boiling range of 144—279C was investigated. It contained 11.2% monocyclic aromatic hydrocarbons (MA), 3.1% bicyclic aromatic hydrocarbons (BA), 5.3% cyclanoaromatic hydrocarbons

Card 1/5 UDC: 62—66: 54—171.001.5

ACC NR: AP7004124

(CA), 43.8% cyclanes, (C), 34.6 alkanes (A) and 1.3% alkenes. Further, the fuel contained 0.47% resins (gums) separable on silica gel, and 0.063% total sulfur, of which 0.0033% was in mercaptans, 0.0290% in sulfides, 0.0090% in disulfides, and 0.029% was accounted for as residual sulfur (mostly thiophenes).

To determine the thermal-oxidative stability, the fuel was first freed from resins and subsequently divided into the compositional fraction. It was noted that BA accumulated in the end fractions, e.g., the 250—279C fraction contained 85% of the total BA. If the chromatographic separation method was used, 75% of the total organosulfur compounds of T-1 fuel accumulated in the aromatic hydrocarbons, while the rest (25%) was found in gums.

The thermal-oxidative stability was determined for each compositional fraction according to a method previously developed by the author and associates by heating the fractions in sealed containers at 160C for 4 hr in oxygen. The results are shown in the table.

As can be seen from the table, pure A and C and their mixtures form no sediments on heating; however, these fuel components undergo considerable oxidation as indicated by the high values of acidity and peroxides formed. Aromatics and organosulfur compounds form solid oxidation products and less oxygen-compounds than A and C. Organosulfur compounds function as

Card 2/5

oxidation inhibitors by reacting with peroxides, forming sulfur-oxygen compounds which are precipitated after further condensation and form sediments. The removal of organosulfur compounds from the aromatics results in a decrease in the sediment formation and an increase in the amount of oxygen-compounds.

The blending of MA with A and C results in an increase of sediment formation after oxidative heating; when BA are present, the sediment formation is increased. It was observed that hydrofined BA exhibit a certain oxidation-inhibiting effect, which can be explained by the formation of antioxidant compounds in their oxidation, namely, phenols. Mixtures of BA with A or C produce more sediments on oxidation than pure BA; this is explained by the low solubility of BA oxidation products and their condensates in alkanes or cyclanes. MA have no inhibiting effect on the oxidation of A and C. The addition of resinous compounds (gums) to the separated fuel components sharply increases sediment formation, and has practically no antioxidant effect.

In summary, organosulfur compounds, resinous compounds, bicyclic and cyclanoaromatic compounds are undesirable components of T-1 fuel. SC and RC can be removed, e.g., by hydrofining, while the content of bicyclic aromatics can be decreased by lowering the distillation end point by 15—20C. Other methods, e.g., adsorption, use of selective solvents, or hydrogena-

Table 1.

Fraction	Sediment mg/100 ml	Bronze corrosion g/m^2	Optical density in reference to benzene	Acidity, mg KOH/100 ml	Peroxides, mg O_2/ml
Initial T-1	20.3	0.8	0.191	5.9	0.12
Hydrofined T-1	5.3	0.2	0.040	8.9	1.62
A	0	0.1	0	12.3	2.7
C	0	0.1	0	11.8	2.3
CA	7.2	0.1	0.100	12.0	2.4
MA	3.1	0.2	0.080	3.9	0.19
Hydrofined MA	1.1	0.1	0.012	11.1	0.92
BA	8.3	0.5	0.181	2.8	0.07
Hydrofined BA	2.3	0.1	0.040	4.8	0.23
C + A (1:1)	0	0.1	0	11.9	2.6
A + 1% SC*)	12.8	0.7	0.068	3.0	0.11
C + 1% SC	11.3	0.6	0.072	2.8	0.09
A + 0.5% RC**)	13.4	0.4	0.170	9.1	0.73
C + 0.5%	13.0	0.4	0.162	8.2	0.90
Hydr. MA + 0.5% RC	9.1	0.3	0.144	3.3	0.38
Hydr. BA + 0.5% RC	8.0	0.4	0.138	2.9	0.18

*) SC = Organosulfur compounds; **) Resinous compounds (gums).

ACC NR: AP7003124

tion, which could be applied for the removal of heavy aromatics and heteroorganic compounds, are less expedient at the present time than by hydrofining and distillation. [WA-28]
[BN]

SUB CODE: 21/ SUBM DATE: 19Jul66/ ORIG REF: 005/ ATD PRESS: 5114

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BOL'SHAKOV, G.I.; KAPINOS, I.I.

Feed of the petroleum products to the space under the arch of the oven chamber. Koks i khim. no.6:21-23 '62. (MIRA 17:2)

1. Keremovskiy koksokhimicheskiy zavod.

GOROVOY, G.P.; BELGORODSKIY, M.L.; B[redacted]AKOV, G.I.

Effect of the composition of coal charges on the hydrogen content of coke-oven gas. Koks i khim. no.1:12-14 '60. (MIRA 13:6)

1. Kemerovskiy koksokhimicheskiy zavod.
(Kemerovo--Coke-oven gas)
(Hydrogen)
(Coal--Carbonization)

BOL'SHAKOV, G.Kh.; SEMENYUK, Yu.V.

Practice of diamond drilling in the Irkutsk Geological Administration. Razved.i okh. nedr 29 no.1:55-56 Ja '63. (MIRA 16:2)

1. Irkutskoye geologicheskoye upravleniye.
(Irkutsk region—Boring)

ZLOBIN, V.V.; BOL'SHAKOV, G.N.

Increasing the strength of supporting core plates in radiators. Trakt. i sel'khozmash. no.11:46 N '64. (MIRA 18:1)

1. Orenburgskiy zavod "Traktorozapchast'".

Bol'shakov, G. P.

AID P - 5171

Subject : USSR/Engineering

Card 1/1 Pub. 103 - 12/19

Author : Bol'shakov, G. P.

Title : Precision grinding of evolute surfaces

Periodical : Stan. i instr., 6, 37-39, Je 1956

Abstract : A brief description of the grinding of the surfaces 200 to 300 mm long, with the precision in profile up to 0.01 mm, as it is done at the Automobile Plant im. Stalin (ZIS) and the Moscow Instrument Plant (MIZ). Seven drawings.

Institutions: As above

Submitted : No date

ZOT'YEV, A.I., kand.tekhn.nauk, red.; BOL'SHAKOV, G.P., inzh., red.; VYATKIN, V.P., kand.tekhn.nauk, red.; VASIL'YEV, N.N., inzh., red.; YEREMKIN, A. P., inzh., red.; IVAKIN, I.Ya., inzh., red.; MATVEYEV, I.B., kand.tekhn. nauk, red.; MAR'YANCHIK, M.A., inzh., red.; NOVICHKOV, P.V., inzh., red.; PEREVOZCHIKOV, B.S., inzh., red.; PODREZ, S.A., inzh., red.; RUBINENKOVA, L.V., red.; UKHANOV, V.N., red.; CHUDAKOV, P.D., kand.tekhn.nauk, red.; STEPANCHENKO, N.S., red.izd-va; SOKOLOVA, T.F., tekhn.red.

[Investigation and design of drop forging and die stamping machinery] Issledovaniia i raschety mashin kuznechno-shtampovochnogo proizvodstva. Pod red. A.I.Zot'eva. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit. lit-ry. Vol.1. 1959. 233 p. (MIRA 13:4)

1. Eksperimental'nyy nauchno-issledovatel'skiy institut kuznechno-pressovogo mashinostroyeniya.
(Forging machinery)

L 16606-65 EWG(j)/EWP(e)/EWT(m)/EPF(c)/EWA(d)/EPR/EWP(j)/T/EWP(t)/EWP(k)/EWP(b)
Pc-4/Pf-4/Pr-4/Ps-4 ASD(m)-3 JD/WW/HW/DJ/RM/WH

ACCESSION NR: AT4048353 S/3000/64/000/008/0119/0129

AUTHOR: Bol'shakov, G.P.; Tishchenko, G.V.

B+1

TITLE: Investigation of lubricants for cold pressing 19

SOURCE: Moscow. Eksperimental'ny*y nauchno-issledovatel'skiy institut kuznechno-pressovogo mashinostroyeniya. Nauchny*ye trudy*, no. 8, 1964. Novoye v kuznechno-shtampovochnom proizvodstve (Latest developments in the forging industry), 119-129

TOPIC TAGS: cold pressing, steel pressing, pressing lubricant, phosphate film polyvinylbutyral film, graphite, friction coefficient, oxalate film

ABSTRACT: The paper describes a study of the properties of lubricants for cold pressing of steel parts and their optimal compositions. Phosphate films together with surface active substances are the most widely used for such lubricants. Investigations of phosphate films were therefore made in order to determine how the conditions under which phosphating is carried out and the thickness of the film influence the pressing process. The experiments showed that the most effective lubricants for cold pressing of steel are phosphate films with a medium-crystal structure having a thickness of not less than 12 microns. When the effect of various accelerators on the rate of phosphating was investigated, it was found that the highest rate of phosphating was obtained using sodium fluoride in a

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ACCESSION NR: AT4048353

3

concentration of 5 grams/liter. The films were produced by immersion in suitable baths for 10 minutes. The rate of phosphating could be increased still further by increasing the concentration of phosphating agents; the time for obtaining a film of a suitable thickness could then be decreased to about 4 minutes. Use of nitrites as accelerators was found to be ineffective. A suitable instrument for determining the friction coefficient under specific pressures up to 2500 x 10^3 kg/cm^2 and temperatures on the contact surfaces upto 420K is described. It was established that a sharp decrease in the friction coefficient occurs in the temperature interval 320-420K. The best over-all properties are shown by soap-treated phosphate films. Other films can be used effectively in some cases; thus, oxalate films can be used for blanks with a thin layer of scale and for small deformations (pickling, cold and hot washing can then be eliminated); polyvinylbutyral coatings containing 10% graphite can be used for blanks having a clean or slightly oxidized surface (the subsequent chemical and heat treatment of the pressed parts is then eliminated). Orig. art. has: 12 figures, 3 tables and 2 formulas.

ASSOCIATION: Eksperimental'ny*y nauchno-issledovatel'skiy institut kuznechno-pressovogo mashinostroyeniya, Moscow (Experimental Scientific Research Institute of Forging Machinery)

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L 16606-65
ACCESSION NR: AT4048353

SUBMITTED: 00 ENCL: 00 SUB CODE: FP, MM

NO REF SOV: 003 OTHER: 007

Card 3/3

BOL'SHAKOV, I. and RED'KO, A.

Tsestozy - opasnye bolezne ovets (Cestodiasis, a dangerous disease of sheep). Alma-Ata, 1959, 16 pages with illustrations (Ministry of Agriculture of the Kazakh SSR, Administration of Agricultursl Sciences and Propaganda. To assist the veterinary fel'dsher). Free, 4,000 copies. In the Kazakh language.

BOL'SHAKOV, I., izobretatel' (Moskva)

Foundries will be transformed. Izobr.i rats. no.3:3-4 Mr '62. (MIRA 15:2)

(Foundries--Equipment and supplies)
(Automation)

BOLSHAKOV, I.

Minister of Cinematography of the USSR

"Immediate Tasks Facing Soviet Scenario Writers"
Literaturnaya Gazeta, no. 99, Dec. 11, 1948

BOLSHAKOV, I.

"Smash Bourgeois Cosmopolitanism in Cinema Art"

Pravda 1949

BOLSHAKOV, I.

"More Good Film Scenarios"
Literaturnaya Gazeta, 1951

BOLSHAKOV, I.

Vital Tasks of Cinematography (By I. Bolshakov, USSR Minister of Cinematography)

Soviet Source: Pravda, Sept. 4, p. 2

Current Digest of the Soviet Press, Vol. 3, no. 36, 1951, p. 10

BOLSHAKOV, I.

TOWARD NEW SUCCESSES IN SOVIET CINEMATOGRAPHY
(By I. Bolshakov, USSR, Minister of Cinematography

Soviet Source: Pravda, March 18, p. 2

Current Digest of the Soviet Press Vol. 4, no. 11, 1952, p. 22

BOL'SHAKOV, I G EPT
.R92956

SOVETSKOYE KINOISKUSSTVO V POSLEVOYENNYYE GODY. MOSKVA, IZD-VO ZNANIYE, 1952.

39 P. ILLUS. (VSESOYUZNOYE OBSHECHESTVO PO RASPROSTRANENIYU POLITICHESKIKH I NAUCHNYKH ZNANIY. 1952, SERIYA I, NO. 88)

BIBLIOGRAPHICAL FOOTNOTES.

RUSSIA

BOLSHAKOV, I.

Outstanding Soviet films of 1951
Kinomekhanik no. 4, 1952

BOL'SHAKOV, I.

The U.S.S.R. at international fairs and exhibitions. Vnesh.torg.26 no.3: 6-8 Mr '56. (MLRA 9:7)

1.Zamestitel' Ministra vneshney torgovli SSR.
(Exhibitions)

BOL'SHAKOV, I.

International fair in Poznan. Vnesh. torg. 27 no.7:17-19 '57.
(Poznan--Exhibitions) (MLRA 10:8)

BOL'SHAKOV, I.

Participation of the Soviet Union in international exhibitions and fairs. Vnesh.torg. 27 no.11:53-60 '57. (MIRA10:11)
(Russia--Foreign economic relations)

BOL'SHAKOV, I.

The Soviet exhibition in the United States. Vnesh.torg. 29 no.6:11-15 '59. (MIRA 12:9)

1.Zamestitel' Ministra vneshney torgovli SSSR.
(New York--Exhibitions)

BOL'SHAKOV, I.

More than a million Americans became acquainted with the Soviet Union's achievements. Vnesh.torg. 29 no.10:34-37 '59.
(MIRA 12:12)
(New York(City)--Exhibitions)

BOL'SHAKOV, I.

Soviet exhibitions abroad in 1962. Vnesh. torg. 42 no.3: 15-17 '62. (MIRA 15:3)

1. Zamestitel' predsedatelya Gosudarstvennogo komiteta Soveta Ministrov SSSR po kul'turnym svyazyam s zarubezhnymi stranami. (Russia--Industries) (Exhibitions)

BOL'SHAKOV, I.

U.S.S.R. exhibition in Brazil. Vnesh. torg. 42 no.8:17-19 '62.
(MIRA 15:9)

1. Zamestitel' predsedatelya Gosudarstvennogo komiteta Soveta Ministrov SSSR po kul'turnym svyazyam s zarubezhnymi stranami.
(Brazil—Foreign Economic Relations—Russia)

BOL'SHAKOV, I.

Director's office and duty. Sov. profsoiuzy 19 no.6:6-7 Mr '63. (MIRA 16:3)

1. Direktor Kostromskogo l'nokombinata imeni Lenina.
(Kostroma--Textile industry--Management)
(Socialist competition)

9(8) SOV/55-58-6-7/31

AUTHOR: Bol'shakov, I. A.

TITLE: The Passage of Regular and Random Signals Through a Phase Detector of the Commutation Type (Prokhozhdeniye regulyarnykh i sluchaynykh signalov cherez fazovyy detektor kommutatsionnogo tipa)

PERIODICAL: Vestnik Moskovskogo universiteta. Seriya matematiki, mekhaniki, astronomii, fiziki, khimii, 1958, Nr 6, pp 45-58 (USSR)

ABSTRACT: In this paper the concrete scheme of a detector was investigated as a linear system with variable parameters. The scheme is shown by figure 1 and the transformation of the inciding sinusoidal waves into rectangular ones is described both in the device and mathematically. The "switching-over function" $\Omega(t)$ is expanded in a Fourier series; it gives a function for the phase detector, which coordinates the latter within the class of linear systems with variable parameters. This did not include the filter for low frequencies. Furthermore, the analytical expression for the transfer coefficient including the filter for low frequencies is mathematically determined. The following results herefrom: the modulus of the transfer coefficient is independent of time. The "switch-

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The Passage of Regular and Random Signals Through a Phase Detector of the Commutation Type

ing-over function" tends towards 0 like 1/2l + 1), and if the finite time of commutation is taken into account, even more rapidly. The following is further dealt with: 1) Passage of fluctuating signals through the detector. In this case the series of resonance peaks tends towards 0 like $1/(2l + 1)^2$. This is shown explicitly on the basis of the example of white noise passing through the resonance circuit. 2) The case of a reference voltage caused by non-regular disturbances. The spectral density of $\Omega(t)$ and $u_1(t)$ is expressed as the sum of the discrete and the continuous part. Also in this case an expression is found for the fluctuation energy at the output; which, if the disturbance decreases, goes over into the expression for the energy of the ordinary fluctuating signals. On the basis of all these considerations, calculation of the spectral density of the "switching-over function" with fluctuating disturbances is carried out. From the character of the disturbance and from the cascade formed(in the concrete scheme) a doubly characterizing function for the deviation of commutation time may be set up. With their help, the spectral density of the rectangular waves was calculated (Fig 5). In

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The Passage of Regular and Random Signals Through a Phase Detector of the Commutation Type

conclusion, an investigation of the scheme, which is, in principle, equivalent to that which is theoretically dealt with here, is given. There are 9 figures and 11 references, 9 of which are Soviet.

SUBMITTED: June 23, 1957

16(2), 9.8 SOV/55-59-1-10/20

AUTHOR: Bol'shakov, I.A.

TITLE: Detection of Impulse Signals in the Presence of Noise

PERIODICAL: Vestnik Moskovskogo universiteta. Seriya matematiki, mekhaniki, astronomii, fiziki, khimii, 1959, Nr 1, pp 79-92 (USSR)

ABSTRACT: The difference equation of a pulse detector is established for arbitrary sequences of rectangular equidistant impulses of constant duration. The solution of the equation serves for the investigation of a weakly modulated signal under a fluctuation noise. The author proposes new equivalent circuits, containing the linear case as a limit case. In the case of a modulation by cosinusoids the author gives expressions for phase- and amplitude distortions. The properties of the considered detector in dependence of the amplifier are discussed. The obtained equations can be generalized to the case of impulses of variable durance.
The author uses a method of P.I.Kuznetsov, R.L.Stratonovich, and V.I.Tikhonov [Ref 3]. The author thanks G.P.Tartakovskiy for aid.
There are 6 figures, and 5 Soviet references.

SUBMITTED: June 23, 1957

Card 1/1

21326
S/106/60/000/010/001/006
A/055/A033

9,3273

AUTHOR: Bol'shakov, I. A.

TITLE: Effect of the signal and the fluctuation noise on F M-discriminators.

PERIODICAL: Elektrosvyaz', no. 10, 1960, 3 - 13

TEXT: Inasmuch as the F M-discriminator constitutes a non-linear element in automatic frequency control systems so widely used in reception technique, a comprehensive theoretical analysis of the passage of the signal and the noise through the F M-discriminator becomes an important problem in any general analysis of the noiseproof feature of an AFC system taken as a whole. Taking into account the inertness of AFC systems, it is particularly interesting to know the mean value of the voltage at the output of the discriminator and the spectral density in the low-frequency region. In the present article, the author examines the passage of a continuous signal together with the noise through the receiver (containing a mixer and a band-pass amplifier with an automatic gain control circuit) and the F M-dis-

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Effect of the signal and ....

criminator (containing two symmetrically detuned circuits, two amplitude detectors and a substraction circuit). For his analysis, the author chooses a more or less ideal case, admitting certain assumptions and simplifications The spectral density of the signal is, for instance, defined by the approximate function

$$S_{sign.} \exp\left\{-\pi \frac{(f - f_{sign})^2}{\Delta f^{e}_{sign}}\right\}, \left|\Delta f_{sign} \leqslant f_{sign}\right| \qquad (1)$$

where Δf_{sign} is the integral width of the spectrum. The results obtained with this function taken as a basis for calculations are sufficiently correct, however, for any spectral density. The input noise is the white noise with spectral density S_n. [Abstractor's note: Subscript "sign." (signal) in function (1) is the translation of the original "c".] After a thorough mathematical analysis of the processes taking place in the receiver and in the F M-diccriminator, and resorting to the envelope method, the

Effect of the signal and ....

author establishes a formula giving the voltage at the output of the F M--discriminator as a function of various parameters corresponding to: 1) the signal, 2) the noise or 3) the discriminator itself. On the basis of this general formula and of two other equations used by him in his analysis, he derives the mean value of the voltage at the output of the discriminator. The derived expresion allows him to examine the dependence of this mean output voltage upon the detuning of the center frequencies of the heterodyned signal and of the band-pass amplifier. Then the author presents simplified expressions of the mean output voltage and of the transmission factor of the discriminator for the case of signal spectra of small width, and draws some conclusions by comparing these expressions with the previously derived more general formulae. He then derives two approximate formulae giving the spectral density at the discriminator output in the low--frequency region. The spectral density, as given by these formulae, consists of three component parts resulting respectively from: 1) the signal only, 2) the noise only, 3) the combined action of signal and noise. At the end of the article, the author examines briefly the possibility of applying the results of his calculations to the analysis of the noiseproof

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Effect of the signal and ....

feature of AFC systems. The author's general conclusion is the following: the output spectral density can be used (as a magnitude independent of the detuning of the center frequencies of the signal and of the band-pass amplifier) only in cases of small detunings, and also in the presence of sufficiently strong noises. There are 5 figures and 6 references; 5 Soviet-bloc and 1 non-Soviet-bloc. The English language reference reads: Arthur, The statistical properties of the output of a frequency sensitive device. Journal Appl. Phys. v. 25, No. 9, 1954.

SUBMITTED: January 6, 1960

BOL'SHAKOV, I.A.

An error in V.I. Tikhonov's article "Effect of fluctuations on simple parametric systems." Avtom. i telem. 21 no.7:1088 Jl'60. (MIRA 13:10)

(Automatic control) (Tikhonov, V.I.)

16.6100
16.9500 (1031, 1121, 1132)

21798
S/103/61/022/004/005/014
B116/B212

AUTHORS: Bol'shakov, I. A., Repin, V. G. (Moscow)

TITLE: Problems of non-linear filtration. I. With one parameter

PERIODICAL: Avtomatika i telemekhanika, v. 22, no. 4, 1961, 466-478

TEXT: The studies on a linear filtration of a random process from an additive conversion with another random process are based on the fundamental work of Kolmogorov and Wiener. The authors solve the problem of the filtration of a random process (one parameter) from a non-additive conversion of it with another random process (parameter: carrier signal) by making certain assumptions about these two random processes. The operators performing the filtration are found. It is shown that the feedback principle may be applied to realize these operators. An example is brought from the field of radio engineering. Here, filtration is called the continuous measuring of a certain random quantity forming the parameter of the received signal (also a random parameter in a general case). The problem of the Bayes type filtration is solved where the a priori statistics of the parameters are known. The signal, in the case investigated, depends on a parameter which has a

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Gaussian distribution. The following chapters deal with: cases of several parameters, the functional of parameters, the non-Gaussian parameters and the selection cases which depend on the valuations. The authors do not bring any mathematically accurate argumentations for results obtained. A non-linear filter shown in Fig. 2 is first obtained by assuming that mismatching is small and the signal will change rapidly. The optimum non-linear filter in question consists of a single-circuit servosystem with a non-linear discriminator which will separate out the derivation of the logarithm of the credibility function with respect to $\lambda(t)$ at the point $\lambda^*(t)$. $y(t)$ denotes a random function having the parameter $\lambda(t)$. $Z(t)$ is a measure for the error between $\lambda(t)$ and $\lambda^*(t)$. The system is closed by linear smoothing circuits, and it is shown that these will be only linear for a Gaussian parameter error distribution. It mainly differs from the Wiener filter (Fig. 2) in that there is a very non-linear discriminator element (for the input signal $y(t)$ and also in that a feedback (which is shifting the parameter toward the linear section of the discrimination characteristic following a parameter change) is necessary. The logarithm of the credibility function is written as

$$L_{(t_o,\ t)}(y,\ \lambda) = \int_{t_o}^{t} l(y,\ \lambda;\ \tau)\ d\tau \qquad (14).$$

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Here, $l(y, \lambda, \tau)$ basically does not depend on the realization of $y(t)$ and $\lambda(t)$ in the interval (t_0, τ) but on the $y(t)$ and $\lambda(t)$ values of the interval preceding τ with the order of magnitude of a correlation time τ_y of a signal $y(t)$. The operation of the discriminator belonging to an optimum meter consists in determining

$$Z(t) = - \frac{\partial l\ (y, \lambda^*(t); t)}{\partial \lambda} \qquad (15)$$

from the values of the signal $y(t)$ and the running determination of $\lambda^*(t)$. Several examples are brought which show the representation of the logarithm of the credibility function according to expression (14), the parameter form and its coding method are not realized. It is pointed out that the representation of filters with a servosystem will allow to judge previous results differently and also will furnish various new results, even, if the methods to find the Wiener filters are known in a number of cases. There are 6 figures and 4 Soviet-bloc references.

SUBMITTED: October 11, 1960

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Legend to Fig. 2: Simplified single-circuit diagram.
1) discriminator; 2) smoothing circuits.

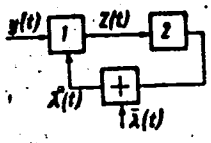

Fig. 2

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BAKUT, P.A.; BOL'SHAKOV, I.A.; GERASIMOV, B.M.; KURIKSHA, A.A.; REPIN, V.G.; TARTAKOVSKIY, G.P., prof.; SHIROKOV, V.V.; ALEKSANDROVA, A.A., red.; BELYAYEVA, V.V., tekhn. red.

[Problems of the statistical theory of radar] Voprosy statisticheskoi teorii radiolokatsii. [By] P.A.Bakut i dr. Pod obshchei red. G.P.Tartakovskogo. Moskva, Sovetskoe radio. Vol.1. 1963. 423 p. (MIRA 16:5)
(Radar)

BOL'SHAKOV, I., izobretatel'

Following Archimedes' principle. Izobr. i rats. no.6:5 '63.
(MIRA 16:8)

L 10242-63 EWT(d)/FCC(w)/BDS--AFFTC--IJP(C)

ACCESSION NR: AP3000989 S/0109/63/008/006/0938/0941

AUTHOR: Bol'shakov, I. A.

51

TITLE: On the problem of nonlinear filtration

SOURCE: Radiotekhnika i elektronika, v. 8, no. 6, 1963, 938-941

TOPIC TAGS: nonlinear signal filtration

ABSTRACT: A new version is found of an optimum filter which can reproduce, with a minimum error, a random Gaussian process which is nonadditively included in another random process. The filter is presented as a logical block diagram and is described and analyzed in mathematical terms. The chief advantage of the new filter lies in the fact that the width of an a-priori distribution (at the initial instant) may exceed the linear part of the optimum discriminator. Also, tunable components are eliminated from the evaluation unit. Orig. art. has: 11 formulas and 1 figure.

ASSOCIATION: none

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ACCESSION NR AM5002719 BOOK EXPLOITATION S/ 59 B+1

Bakut, P. A.; Bol'shakov, I. A.; Gerasimov, B. M.; Kuriksha, A. A.; Repin, V. G.; Tartakovskiy, G. P.; Shirokov, V. V.

Problems of the statistical theory of radar (Voprosy statisticheskoy teorii radiolokatsii), v. 2., Moscow, Izd-vo "Sovetskoye radio", 1964, 1078 p. illus., biblio., index. Errata slip inserted. 6,000 copies printed.

TOPIC TAGS: radar, statistical theory

PURPOSE AND COVERAGE: The second volume of the book is devoted to the theory of radar measurements and problems of target resolution. A general theory of radar measurements is developed which contains the analysis of tracking and nontracking measurement systems, linear and nonlinear, and the synthesis of optimal systems of measuring the motion parameters of targets which change over time and their combinations. On the basis of this theory, the book presents an analysis and synthesis of long-range systems, systems of speed measurement, and angular measurement systems. Coherent and incoherent signals are investigated. In considering the problems of target resolution, the possibility of resolving reflected signals is studied and optimal receivers in this respect are found. Optimal resolution systems in detection and measurement of

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coordinates are also investigated. The book is intended for researchers and engineers concerned with problems of radar and for students and graduate students. Many problems of the general theory are also of interest to those concerned with theoretical problems in all fields based on the theory of statistics, particularly in automatic control.

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SUBMITTED: 30Jun64 SUB CODE: DC

NO REF SOV: 046 OTHER: 024

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ACCESSION NR: AP4041963 S/0280/64/000/003/0084/0094

AUTHOR: Bol'shakov, I. A. (Moscow)

TITLE: Determination of group parameters from a random number of signals immersed in noise

SOURCE: AN SSSR. Izv. Tekhnicheskaya kibernetika, no. 3, 1964, 84-94

TOPIC TAGS: automation, automatic control system, signal reception, information transmission, noise, group parameter

ABSTRACT: The theory of random correlated points, introduced by P. I. Kuznetsov and R. L. Stratonovich (Izv. AN SSSR, ser. matem., 1956, 20, 167; Energetika i avtomatika, 1961, No. 2), is used to derive the a posteriori probability of a parameter of a group which consists of a random number of statistically identical signals. A general expression for a single group is given first and then simplifications for nonoverlapping signals with Poisson and pairwise correlated point systems are given. The group parameter in question can be the coordinates of the center, effective length, average number of signals, etc. A system which gives the optimum statistical estimate of the group parameter for nonoverlapping, pairwise correlated signals is derived by maximizing the a posteriori probability and the variance of this estimate is given for overlapping signals with gaussian or

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ACCESSION NR: AP4041963

nearly gaussian a priori distribution and for nonoverlapping signals. As a specific example, a group of deterministic signals in white noise is considered. A procedure for determining the center of the group is given. The detection and parameter estimation procedures are vastly complicated when the number of groups present is considered to be random. The estimation of the a priori distribution of groups is essentially the same as the estimation of signal distribution in a single group, but simultaneous detection and parameter estimation of a random number of groups requires thresholds whose levels depend on the input signal characteristics and the required accuracy with which the groups must be distinguished. Research remains to be done on methods of estimating the internal parameters of each group in the multi-group case. Orig. art. has:; 58 equations and 1 figure.

ASSOCIATION: none

SUBMITTED: 06Aug63 ENCL: 00 SUB CODE: IE, DP

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Card 2/2

ACCESSION NR: AP4017589 S/0109/64/009/002/0201/0210

AUTHOR: Bol'shakov, I. A.; Bugachev, G. F.; Vatollo, V. V.

TITLE: Discerning the parameters of signals separated from noise

SOURCE: Radiotekhnika i elektronika, v. 9, no. 2, 1964, 201-210

TOPIC TAGS: signal noise discrimination, mixed signals separation, mixed signals separation theory, mixed signals noise separation

ABSTRACT: The problem of optimum Bayes filtration 1 of random-variable parameters of kindred signals received as a mixture with a noise background is solved. An optimum "measuring filter" is suggested whose special device can discriminate the parameters by the form of their coding in the mixture and by the nature of their time variation. Measuring time delays of two pulsed periodic signals of like shape, against a normal white background, is considered as a "practical example" illustrating the theory. It is inferred that the theory can be

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